

WHAT IS CLAIMED IS:

1. An exhaust emission control method for treating exhaust gas emitted from an internal combustion engine, comprising the steps of:

locating an emission control device in an exhaust gas passage of the internal combustion engine, the emission control device storing SO_x when an air/fuel ratio of exhaust gas flowing through the emission control device is lean, and releasing the stored SO_x when a temperature of the emission control device is raised to a desulfurization temperature or higher and the air/fuel ratio of the exhaust gas flowing through the emission control device becomes substantially equal to a stoichiometric air/fuel ratio or rich;

performing a temperature control process to control the temperature of the emission control device to be within a predetermined temperature range whose lower limit is substantially equal to or higher than a desulfurization temperature; and

performing a desulfurization process to release sulfur from the emission control device by controlling the air/fuel ratio of the exhaust gas flowing through the emission control device to be substantially equal to the stoichiometric air/fuel ratio or rich when the temperature of the emission control device is within the predetermined temperature range, wherein

the temperature control process and the desulfurization process are repeated when sulfur is to be released from the emission control device.

2. The exhaust emission control method according to claim 1, wherein in the temperature control process, the temperature of the emission control device is raised or lowered by controlling the air/fuel ratio of the exhaust gas flowing through the emission control device.

3. The exhaust emission control method according to claim 1, wherein an amount of the exhaust gas flowing through the emission control device is larger in

the temperature control process than that in the desulfurization process.

4. The exhaust emission control method according to claim 1, wherein the temperature control process and the desulfurization process are repeated until release of sulfur from the emission control device is finished.

5. The exhaust emission control method according to claim 1, wherein the temperature control process and the desulfurization process are repeated until a total time of execution of the desulfurization process reaches a set value.

6. The exhaust emission control method according to claim 1, wherein the temperature control process and the desulfurization process are repeated a predetermined number of times.

7. The exhaust emission control method according to claim 1, wherein the temperature control process continues for a first predetermined period of time and the desulfurization process continues for a second predetermined period of time.

8. The exhaust emission control method according to claim 7, wherein at least one of the first predetermined period of time and the second predetermined period of time is determined depending upon an operating state of the internal combustion engine.

9. The exhaust emission control method according to claim 7, wherein the first predetermined period of time for the temperature control process is corrected according to a rate of increase or decrease of the temperature of the emission control device, and the second predetermined period of time for the desulfurization process is corrected according to a speed of release of sulfur from the emission control device.

10. The exhaust emission control method according to claim 1, wherein the air/fuel ratio of the exhaust gas flowing through the emission control device is controlled in the temperature control process according to a rate of increase or decrease of the temperature of the emission control device, and the air/fuel ratio of the exhaust gas flowing through the emission control device is controlled in the desulfurization process according to a speed of release of sulfur from the emission control device.

11. The exhaust emission control method according to claim 1, wherein the emission control device comprises a NOx storage agent that stores NOx when the air/fuel ratio of the exhaust gas flowing through the NOx storage agent is lean, and releases the stored NOx for reduction and removal when the air/fuel ratio of the exhaust gas flowing through the NOx storage agent is reduced and a reductant is present in the exhaust gas.

12. An exhaust emission control system for treating exhaust gas emitted from an internal combustion engine, comprising:

an emission control device disposed in an exhaust gas passage of the internal combustion engine, the emission control device storing SOx when an air/fuel ratio of exhaust gas flowing through the emission control device is lean, and releasing the stored SOx when a temperature of the emission control device is raised to a desulfurization temperature or higher and the air/fuel ratio of the exhaust gas flowing through the emission control device becomes substantially equal to a stoichiometric air/fuel ratio or rich; and

a controller that:

performs a temperature control process to control the temperature of the emission control device to be within a predetermined temperature range whose lower limit is substantially equal to or higher than the desulfurization temperature; and

performs a desulfurization process to release sulfur from the emission

control device by controlling the air/fuel ratio of the exhaust gas flowing through the emission control device to be substantially equal to the stoichiometric air/fuel ratio or rich when the temperature of the emission control device is within the predetermined temperature range, wherein

the controller repeats the temperature control process and the desulfurization process when sulfur is to be released from the emission control device.

13. The exhaust emission control system according to claim 12, wherein in the temperature control process, the controller raises or lower the temperature of the emission control device by controlling the air/fuel ratio of the exhaust gas flowing through the emission control device.

14. The exhaust emission control system according to claim 12, wherein the controller controls an amount of the exhaust gas flowing through the emission control device to be larger in the temperature control process than that in the desulfurization process.

15. The exhaust emission control system according to claim 12, wherein the controller repeats the temperature control process and the desulfurization process until release of sulfur from the emission control device is finished.

16. The exhaust emission control system according to claim 12, wherein the controller repeats the temperature control process and the desulfurization process until a total time of execution of the desulfurization process reaches a set value.

17. The exhaust emission control system according to claim 12, wherein the controller repeats the temperature control process and the desulfurization process a predetermined number of times.

18. The exhaust emission control system according to claim 12, wherein the controller continues the temperature control process for a first predetermined period of time and continues the desulfurization process for a second predetermined period of time.

19. The exhaust emission control system according to claim 18, wherein at least one of the first predetermined period of time and the second predetermined period of time is determined depending upon an operating state of the internal combustion engine.

20. The exhaust emission control system according to claim 18, wherein the first predetermined period of time for the temperature control process is corrected according to a rate of increase or decrease of the temperature of the emission control device, and the second predetermined period of time for the desulfurization process is corrected according to a speed of release of sulfur from the emission control device.

21. The exhaust emission control system according to claim 12, wherein the controller controls the air/fuel ratio of the exhaust gas flowing through the emission control device in the temperature control process according to a rate of increase or decrease of the temperature of the emission control device, and controls the air/fuel ratio of the exhaust gas flowing through the emission control device in the desulfurization process according to a speed of release of sulfur from the emission control device.

22. The exhaust emission control system according to claim 12, wherein the emission control device comprises a NO_x storage agent that stores NO_x when the air/fuel ratio of the exhaust gas flowing through the NO_x storage agent is lean, and releases the stored NO_x for reduction and removal when the air/fuel ratio of the exhaust gas flowing through the NO_x storage agent is reduced and a reductant

is present in the exhaust gas.